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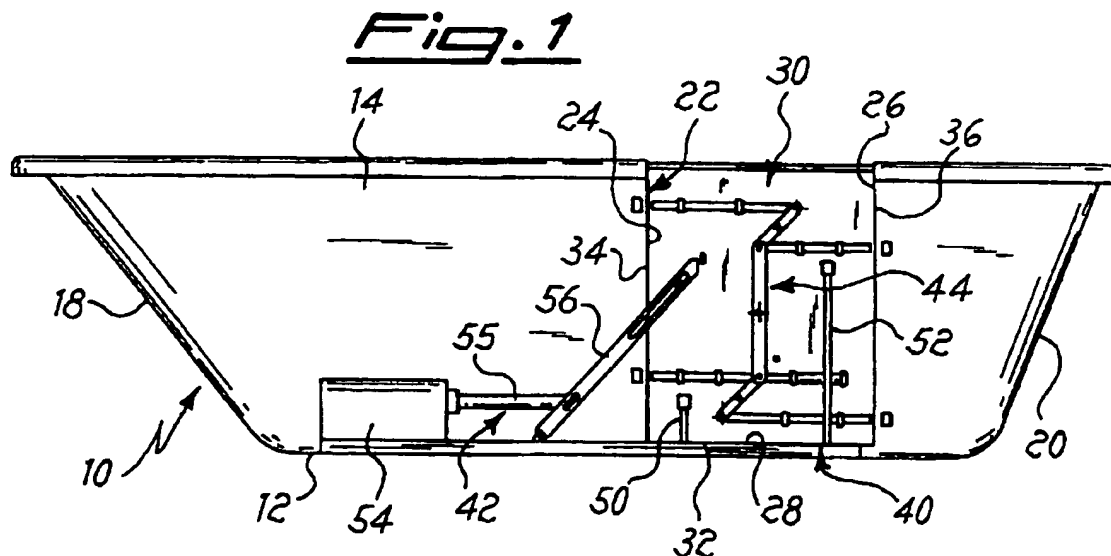
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(54) Bath tub with door

(57) In a bath an inlet opening (22) is provided, in a side-wall (24) thereof, with a door (30) designed to have an open position for the inlet of the user and a closed position in which the outlet of the water in the tub (10) is prevented.



Description

The present invention relates to a bath tub.

The bath tubs are usually defined by a bottom and sidewalls and therefore the user who wishes to enter to have a bath or go out at the end of the same must necessarily overcome one of the walls. This inevitably causes some drawbacks.

In fact, due to the height of the sidewalls of the tub, there are considerable difficulties in overcoming said walls, above all for older or ill people having a physical handicap.

Furthermore, taking into account that the bath tub is generally made of material with a smooth and then a slippery surface, it is self evident that the user might easily fall, especially taking into account that the room wherein the tub is placed, is damp and moreover that the bottom of the tub and floor are often wet, sometimes even with soapy water.

Obviously the change of falling are increased due to the necessity of overcoming the edge of the tub.

The object of the present invention is then to provide a bath tub in which the inlet is facilitated thus avoiding all the drawbacks cited with reference to the reported prior art.

The object is reached by a bath tub of the type comprising at least a delimiting longitudinal side wall, characterized in that said longitudinal side wall has an inlet opening for the user and is provided with a door associated with said opening designed to have an open position to allow the user to enter and a closed position in which the outlet of the water contained in the tub is avoided.

In this way, the user who wishes to have a bath, before filling the tub, opens the door, enters into the tub, closes the door and, at the end, fills the tub. Obviously the same operations are carried out in an opposite way when the bath is finished and the user wishes to go out from the bath tub.

It is clear that the inlet into and the outlet from the bath tub are simple because the user must simply overcome a step corresponding to the difference of level between the floor and the lower edge of the opening.

The risk of sliding is then substantially eliminated.

In a particular embodiment of the invention, said opening extends starting from the upper edge of said sidewall up to the area near the bottom of the tub.

In this way, the step that the user must overcome is reduced to a minimum with consequent reduction to a minimum of the risk of falling.

In a further embodiment the bottom of the opening is slightly raised with a height approximately equal to that of a stair step, i.e. about 20-25 cm. with respect to the bottom of the tub. In this manner, not only the water which may remain on the bottom of the tub may not go out through the opening in case the door is opened, but it is possible to partially fill the tub before the entry of the user.

These and other advantages of the invention will be

greatly self evident from the following detailed description of an embodiment given by a non limitative example with reference to the enclosed drawings, in which:

- 5 - figure 1 is a side view of a bath tub according to the present invention in which the door is represented in a closed though unlocked position;
- 10 - figure 2 is a partial plan view of the bath tub of figure 1;
- figure 3 is a partial side view of the same bath tub;
- 15 - figure 4 depicts an enlarged side view of the assembly of the same tub.

In figures 1 and 2 a bath tub is represented a bath tub, indicated in general by 10, comprising a bottom 12, two longitudinal side walls 14, 16 and two transverse walls 18, 20.

The longitudinal wall 14 has an opening 22 defined by two sides 24, 26 vertically extending from the upper edge of the same wall up to the bottom 12 of the tub 10 and by a lower edge 28 slightly raised with respect to the bottom 12.

As shown, the bath tub 10 is provided with a door 30 for closing the opening 22 which can be moved longitudinally on the outside of the tub 10. The door 30 has a shape substantially equal to that of the opening 22 i.e. it has a lower edge 32 and two sides 34, 36 that, when the door 30 is in the closing position, rest respectively on the sides 24, 26 of the opening 22. The sides 24, 26 of the opening 22 are tapered so that the opening 22 diverges towards the outside of the tub 30 whereas the sides 34, 36 of the door 30 are tapered in a complementary way so as to rest entirely on the sides 24, 26 of the opening 22 when the door 30 is closed.

At last, a sealing gasket (not depicted in the figures) designed to prevent the outlet of the water contained in the tub is interposed between the sides 24, 26 and the lower edge 28 of the opening 22 and the sides 34, 36 and the lower edge 32 of the door 30.

There are a guiding device 40 and a moving device 42 for moving and closing the door 30 whereas there is a blocking device 44 for keeping the same in the closed position.

With reference to figures 1, 2 and 3, the guiding device 40 consists of two longitudinal guides 46, 48 made on the basement of the tub 10 in which slide respectively the lower ends 50a, 52a of corresponding vertical bars 50, 52, the upper ends 50b, 52b of which are integral with the door 30. In particular, the bar 50 is slidable in the innermost guide 46 and its upper end 50b is fixed near the lower edge 32 of the door 30 whereas the bar 52 is slidable in the outermost guide 48 and its upper end 52b is fixed to the door 30 substantially in the middle of its height.

Furthermore, figure 2 shows that the end portions

46a, 48a of the respective guides 46, 48, in which the lower ends 50a, 52a of the vertical bars 50, 52 are engaged, are oriented towards the tub 10 in order to move the door 30 for completely closing the opening 22.

The moving means 42 (figures 1, 3 and 4), which are placed on the outer surface of the longitudinal wall 14, comprise a per-se known piston 54, for example of the oleodynamic or pneumatic type, horizontally arranged, the rod 55 of which operates a crank 56 pivoted in the basement of the tub 10.

More precisely, the free end of the rod 55 is slidable in a slot 57 made in the crank 56. The crank 56 has, starting from its free end and along part of its length, a groove 60 in which a pin 62 attached to the door 30 is free to slide.

The blocking device 44 of the door 30 comprises a plane articulated mechanism arranged on the outer surface of the door 30 and comprised of a control rod 64 pivoted, in its middle, to the door 30 and vertically arranged when the device is in the closing position as illustrated in figure 4. The control rod 64 has, at its upper ends 64a and lower ends 64b, a longitudinal slit (not depicted in the figures). In each of the slits is housed and slides a respective pin 65, 67 attached to the ends of respective blocking rods 66, 68 which are horizontally arranged on opposite sides with respect to the control rod 64 and longitudinally slidable in a pair of rings 70 fixed to the door 30.

Furthermore, the ends 64a, 64b of the control rod 64 are respectively connected with the transmission rods 72, 74 hinged to the door 30 at the middle area thereof. The transmission rods 72, 74 have, at both ends, a longitudinal slit: a slit of each transmission rod 72, 74 houses a different pin 65, 67 of the control rod 64 whereas the opposite longitudinal slits house respective pins 75, 77 each of which attached to an end of respective blocking rods 76, 78 horizontally arranged and longitudinally slidable in a pair of rings 70 and arranged on opposite sides with respect to the control rods 66, 68.

At last, there is a piston 81, for example of the oleodynamic or pneumatic type, the rod 79 of which is connected to an end of the control rod 64.

When the blocking device 44 is in unlocked position (figures 1 and 4), the free ends of the four blocking rods 66, 68, 76, 78 are positioned within the shape of the door 30. By operating the device, i.e. by operating the piston 81, the control rod 64 rotates moving the ends of the blocking rods and then the rods towards the outside of the door 30 so that their free ends projects sideways from the same engaging in corresponding bridges 80 made on the outside of the longitudinal wall 14 of the tub, near the opening 22.

Moreover, there is a sensor 82 for detecting the closure of the door 30 placed on the door so as to face the free end of the crank 56 when the door 30 is in the locked position and a sensor 84 for detecting the unlocking of the door 30 placed on the door so as to face the lower end 64b of the control rod 64 when the articulated mechanism

is in the unlocked position.

For closing the door 30, starting from the opening position of the same (figure 4), it is sufficient to operate the piston 54 which, rotating the crank 56, moves the door 30 along the guides 46, 48 as far as it reaches the closing position detected by the closing sensor 82 which activates the piston 81 which operates the locking device 44 for locking the door 30.

The opening operation occurs in an opposite way, i.e. the piston 81 is activated and it operates the locking mechanism 44 thus completely unlocking the door 30 moving it to the completely unlocked position detected by the sensor 84 that activates the piston 54 which, rotating the crank 56, allows the opening of door 30.

It is self evident that any conceptually and structurally equivalent changes fall within the scope of this invention.

For example, at the ends of the control rod and transmission rods it is possible to provide a control rod and transmission rods having extendable end portions, for example in a telescope way, instead of longitudinal slits.

Furthermore, it is possible to provide a door hinged with the lower edge of the opening or with a side or provide a door the sides of which are slidable in respective grooves made in the sides of the opening.

Claims

1. Bath tub of the type comprising at least a non-wall delimiting longitudinal side wall (14), characterized in that said longitudinal side wall (14) has an inlet opening (22) for the user and is provided with a door (30) associated with the same designed to have an open position to allow the user to enter and a closed position in which the outlet of the water contained in the tub (10) is avoided.
2. Bath tub according to claim 1, characterized in that said opening (22) extends starting from the upper edge of said longitudinal wall (14) up to the area near the bottom (12) of the tub (10).
3. Bath tub according to claim 1 or 2, characterized in that said opening (22) is substantially U-shaped having two sides (24, 26) perpendicular to the upper edge of the longitudinal wall (14), substantially parallel between them and having also a substantially horizontal lower edge (28).
4. Bath tub according to the preceding claim, characterized in that said lower edge (28) of the opening (22) is slightly raised with respect to the bottom (12) of the tub (10) with a height approximately equal to that of a stair step, i.e. of about 20-25 cm.
5. Bath tub according to any one of claims 3 and 4, characterized in that the sides (24, 26) of the opening

- (22) are tapered so that the opening (22) diverges towards the outside of the tub (10) whereas the sides (34,36) of the door (30) are tapered in a complementary way so as to completely rest on the sides (24,26) of the opening (22) when the door (30) is closed. 5
6. Bath tub according to the any one of claims 3 to 5, characterized in that a sealing gasket is interposed between the peripheral edge (32,34,36) of said door (30) and the peripheral edge (24,26,28) of said opening (22). 10
7. Bath tub according to the any one of the preceding claims, characterized in that said door (30) is provided with guiding means (40) so as to be movable from the open position to the closed position and vice-versa. 15
8. Bath tub according to the preceding claim, characterized in that said guiding means (40) comprise at least two longitudinal and parallel guides (46,48) made on the basement of the tub (10) in each of which is slidable at least a projecting member (50,52) integral with the door (30) so that the same is longitudinally slidable and is slightly spaced from the longitudinal wall (14). 20 25
9. Bath tub according to the preceding claim, characterized in that each of said at least two guides (46,48) has an end portion (46a,48a) folded towards the tub (10) so that the door (30) during the end part of the closing operation moves towards the longitudinal wall (14) completely closing the opening (22). 30
10. Bath tub according to the preceding claim, characterized in that said guides (46,48) are two in number and in each of them slides the lower end (50a,52a) of a vertical rod (50,52), the upper end (50b,52b) of which is integral with the door (30). 35 40
11. Bath tub according to the preceding claim, characterized in that said two vertical rods (50,52) are longitudinally spaced, one being fixed to the door (30) near its lower edge (32) and the other one being substantially fixed in the middle of its height. 45
12. Bath tub according to any one of claims 7 to 11, characterized in that said door (30) is provided with moving means (42) designed to move the door from the opening position to the closing position and vice-versa. 50
13. Bath tub according to the preceding claim, characterized in that said moving means comprise a crank (56) pivotted, in one of its ends, in the basement of the tub (10) and is provided at its opposite end with a longitudinal groove (60) in which a pin (62) integral with the door (30) is slidable, said crank being operated by motor means (54). 55
14. Bath tub according to the preceding claim, characterized in that said motor means for operating the crank (56) consist of a piston (54), the rod (55) of which is connected with the crank (56)
15. Bath tub according to the preceding claim, characterized in that there is a sensor (82) for detecting the closure of the door (30) arranged on the door so as to face the free end of the crank (56) when the door (30) is closed.
16. Bath tub according to any one of the preceding claims, characterized in that said door (30) is provided with locking means (44) for locking the door (30) in the closing position.
17. Bath tub according to the preceding claim, characterized in that said locking means (44) consist of a plane articulated mechanism arranged on the door (30) comprising a control rod (64) pivotted, in one of its intermediate points, to the door (30) provided, in each of its ends (64a,64b), with a longitudinal slit in each of which is housed and slides a respective pin (65,67) attached to an end of respective locking rods (66,68) extending substantially horizontally in opposite directions with respect to the control rod (64) and longitudinally slidable, the free ends of which are designed to be engaged in bridges (80) near the opening (22).
18. Bath tub according to the preceding claim, characterized in that said mechanism comprises also a pair of transmission rods (72,74) pivotted, in an intermediate point thereof, to the door (30) and provided, at both their ends, with longitudinal slits, said two transmission rods (72,74) engaging in a their slit a different pin (65,67) of the control rod (64) and the two opposite slits engaging respective pins (72,74) fixed to an end of respective locking rods (76,78) arranged substantially horizontally, longitudinally slidable and each extending in opposite directions with respect to the locking rod (66,68) connected to the same transmission rod (72,74), the free ends of which are designed to be engaged in corresponding bridges (80) made outside on the longitudinal wall (14) near the opening (22).
19. Bath tub according to preceding claim 17 or 18, characterized in that said articulated mechanism is operated by motor means.
20. Bath tub according to the preceding claim, characterized in that said motor means for operating the articulated mechanism consist of a piston (81), the rod (79) of which operates on the control rod (64).

21. Bath tub according to the preceding claim, characterized in that there is a sensor (84) for detecting the locking of the door (30) arranged on the door so as to face an end (64b) of the control rod (64) when the articulated mechanism is in the unlocked position. 5

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Fig. 1

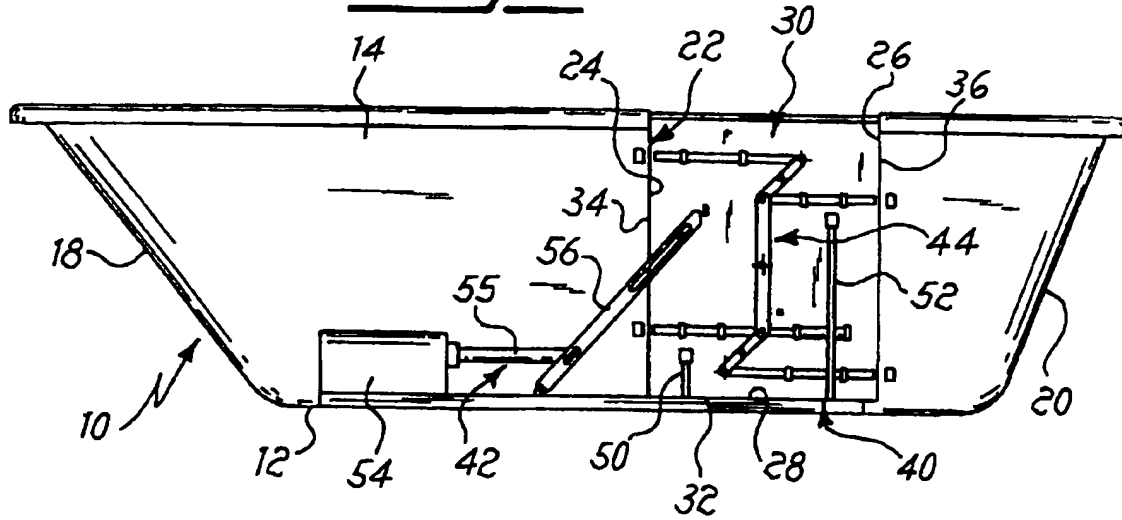


Fig. 2

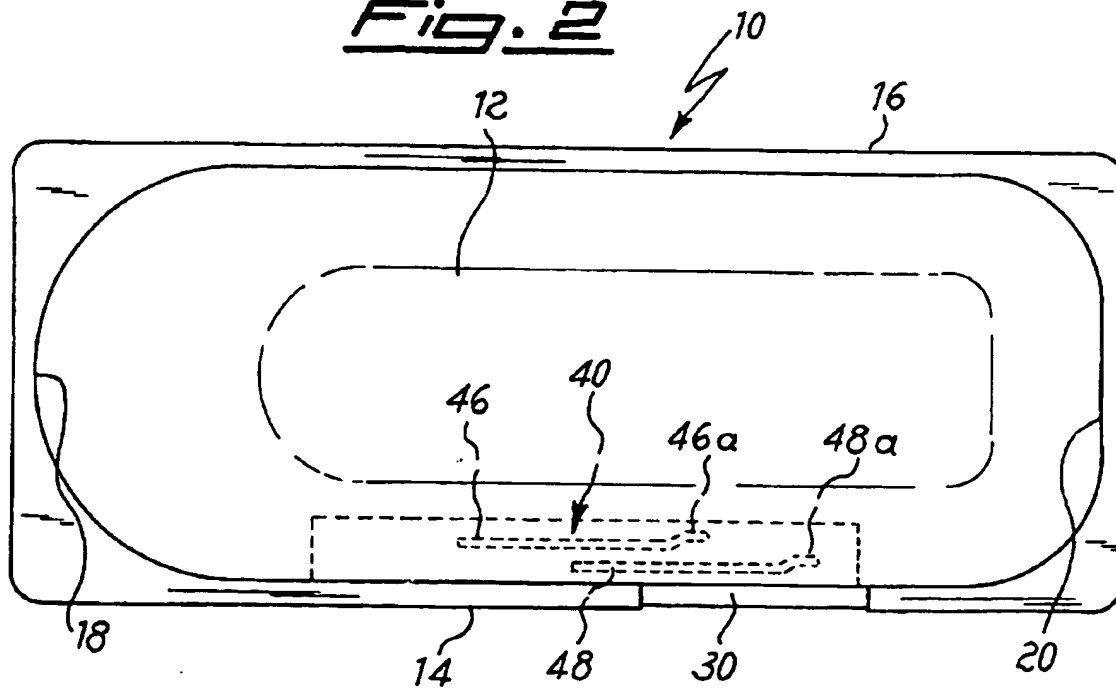


Fig. 3

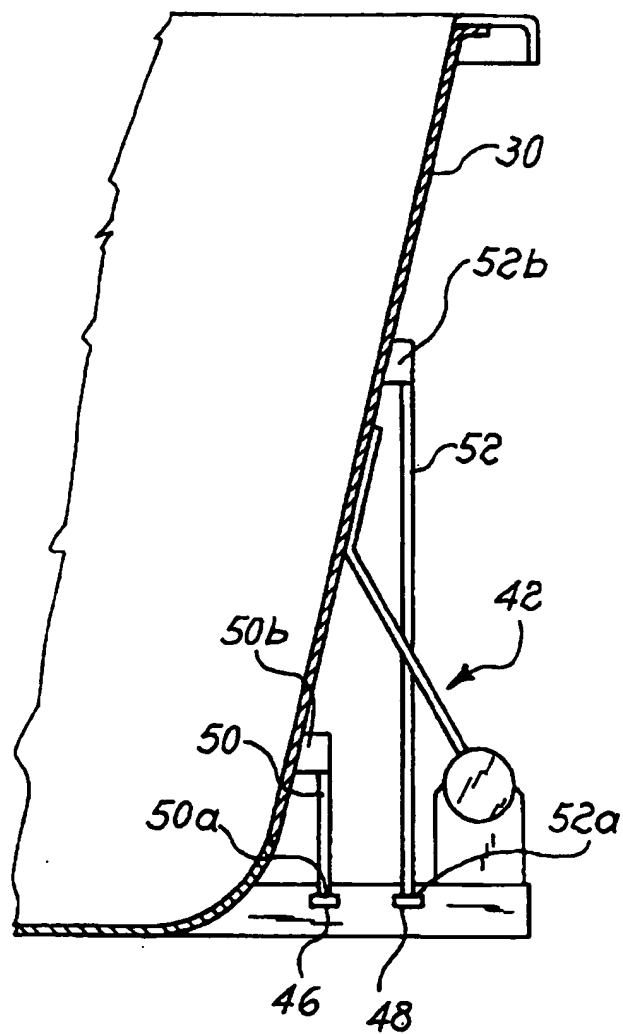
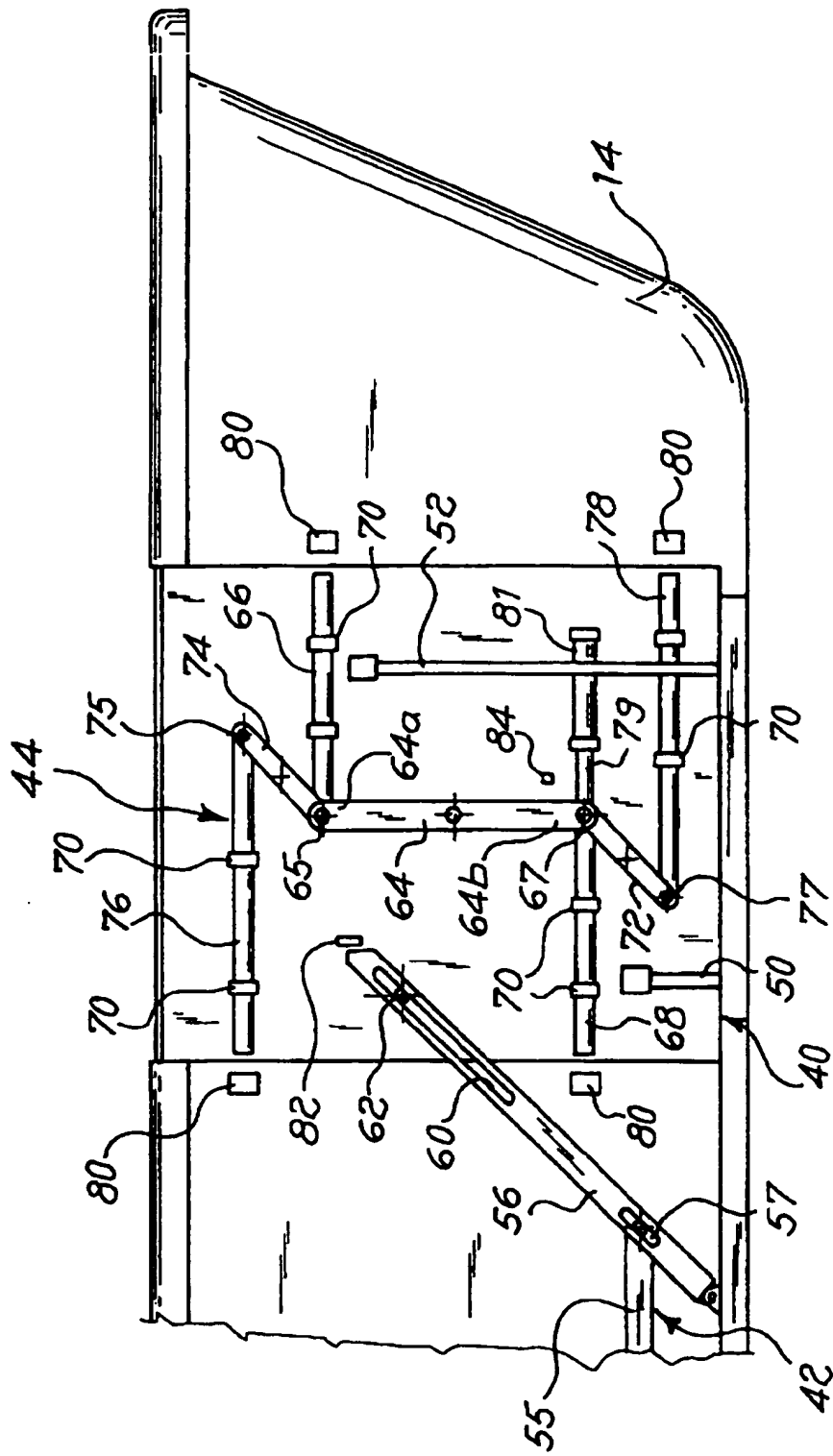


Fig. 4





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 95 20 1916

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE-A-26 52 792 (APPELT) * the whole document * ---	1-3,6-9, 16	A47K3/00
X A	US-A-4 360 935 (BARRETT, SR) * column 3, line 19 - column 4, line 42; figures 1-3 * ---	1-3,6,16 17,18	
X	DE-A-24 61 372 (ICKERT) * the whole document * -----	1-4,6,16	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			A47K
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 24 October 1995	Examiner Vrugt, S
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